

REMARKS

The Office Action dated May 18, 2004, has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto. In the outstanding Office Action claims 2, 3, 8, and 9 were rejected under 35 U.S.C. § 102(e) (two different rejections) and claims 4 and 7 were rejected under 35 U.S.C. § 103(a) (two different rejections). Claims 5, 6, and 11 were indicated as containing allowable subject matter, but were objected to as being dependent on a rejected base claim. No new matter has been added. Accordingly, claims 2-9 and 11 are pending in this application and are submitted for reconsideration.

35 U.S.C. § 102(e)

Claims 2, 3, 8, and 9 were rejected under 35 U.S.C. § 102(e) as being anticipated by Stewart (U.S. Pat. No. 5,952, 789). In making this rejection the Office Action asserts that this references teaches the claimed invention.

Claim 2 recites in part:

a nonvolatile data holding section integrated with said control element or connected to said control element and capable of holding control data of said control element in a floating state.

The present invention relates to a display device where a nonvolatile data holding section which can hold the data in a floating state is installed for each pixel and the pixel of the same data is not rewritten but the display data is rewritten only when the data is changed to save electric power consumption. Consequently, the nonvolatile data holding section that holds the data is essential to continue display even if signals are not periodically applied to the control line (data line). Examples of the nonvolatile

data holding section include a ferroelectric capacitor, an element utilizing a magnetoresistance effect, and a single electron memory.

Applicants have carefully reviewed Stewart, but could find no disclosure or suggestion of a nonvolatile data holding section. Stewart discloses a capacitor C1. However, with a regular capacitor, the data can be held only if a voltage is continuously applied but is lost once the voltage is turned off. Consequently, a regular capacitor can not be or function as a nonvolatile data holding section.

Furthermore, even in the case of a ferroelectric capacitor, the data gradually escapes if both ends are connected to conductors. Thus, at least one electrode of the ferroelectric capacitor must be held in a floating state. To achieve a floating state, as described in lines 2 through 18 of page 18 of the present specification, one electrode must be electrically insulated by a gate insulating film of a MOS transistor, a capacitor, or the like. However, the capacitor C1 of Stewart is connected to the drain/source of a transistor or wiring, indicating that they are not in a floating state. The floating state cannot be achieved by the capacitor connected to the drain/source semiconductor layer.

Furthermore, to erase the data of the nonvolatile memory, the voltage opposite to that in the case of writing must be applied (for example, page 14, lines 1 through 6 of the specification). However, nothing is disclosed or suggested about such erasing means, indicating that Stewart does not use a nonvolatile memory.

With respect to claim 3, the Office Action asserts that in Stewart, the transistor T1 connected between the data holding section C1 and control line S2 is a selective transistor, but T1 is not connected between C1 and S2. In the first place, even if C1 is assumed to be a nonvolatile data holding section, C1 is not connected between the

control element T2 and the control line D1. S2 is a selective line. The control line corresponds to D1 and C1 must be connected between D1 and the gate of T2.

With respect to claim 8, Applicants have carefully reviewed Stewart and could find no disclosure or suggestion of a single electron memory.

Accordingly, Stewart fails to teach and or suggest the claimed invention. Specifically, this reference fails to teach and/or suggest the recited "nonvolatile data holding section integrated with said control element or connected to said control element and capable of holding control data of said control element in a floating state." Therefore, Applicants request reconsideration and withdrawal of this rejection of claims 2, 3, 8, and 9 under 35 U.S.C. § 102(e).

Claims 2, 3, and 9 were rejected under 35 U.S.C. § 102(e) as being anticipated by Dawson (U.S. Pat. No. 6,229,506). In making this rejection the Office Action asserts that this references teaches the claimed invention.

Claim 2 recites in part:

a nonvolatile data holding section integrated with said control element or connected to said control element and capable of holding control data of said control element in a floating state.

The present invention relates to a display device where a nonvolatile data holding section which can hold the data in a floating state is installed for each pixel and the pixel of the same data is not rewritten but the display data is rewritten only when the data is changed to save electric power consumption. Consequently, the nonvolatile data holding section that holds the data is essential to continue display even if signals are not periodically applied to the control line (data line). Examples of the nonvolatile data holding section include a ferroelectric capacitor, an element utilizing a magnetoresistance effect, and a single electron memory.

Applicants have carefully reviewed Dawson, but could find no disclosure or suggestion of a nonvolatile data holding section. Dawson discloses a capacitor Cs. However, with a regular capacitor, the data can be held only if a voltage is continuously applied but is lost once the voltage is turned off. Consequently, a regular capacitor cannot be or function as a nonvolatile data holding section.

Furthermore, even in the case of a ferroelectric capacitor, the data gradually escapes if both ends are connected to conductors. Thus, at least one electrode of the ferroelectric capacitor must be held in a floating state. To achieve a floating state, as described in lines 2 through 18 of page 18 of the present specification, one electrode must be electrically insulated by a gate insulating film of a MOS transistor, a capacitor, or the like. However, the capacitor Cs of Dawson is connected to the drain/source of a transistor or wiring, indicating that they are not in a floating state. The floating state cannot be achieved by the capacitor connected to the drain/source semiconductor layer.

Furthermore, to erase the data of the nonvolatile memory, the voltage opposite to that in the case of writing must be applied (for example, page 14, lines 1 through 6 of the specification). However, nothing is disclosed or suggested about such erasing means, indicating that Dawson does not use a nonvolatile memory.

Accordingly, Dawson fails to teach and or suggest the claimed invention. Specifically, this reference fails to teach and/or suggest the recited “nonvolatile data holding section integrated with said control element or connected to said control element and capable of holding control data of said control element in a floating state.” Therefore, Applicants request reconsideration and withdrawal of this rejection of claims 2, 3, and 9 under 35 U.S.C. § 102(e).

35 U.S.C. § 103(a)

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Stewart in view of Adachi (U.S. Pat. No. 5,631,664). In making this rejection the Office Action asserts that the combination of these references teach and/or suggest the claimed invention. The Office Action also asserts that it would be obvious to one of ordinary skill in the art to combine these two references.

The Office Action admits that Stewart fails to disclose the recited ferroelectric capacitor. The Office Action cites Adachi as curing this deficiency in Stewart. While Adachi may teach a ferroelectric capacitor, there is no motivation to combine Stewart and Adachi since Stewart fails to teach any nonvolatile data holding elements. Specifically, there is no motivation in these references to replace a volatile data holding element with a non-volatile data holding element.

Therefore a person of ordinary skill in the art would have no motivation to combine these references. Consequently, Applicants request reconsideration and withdrawal of this rejection of claim 4.

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Stewart in view of Taguchi (U.S. Pub. No. US2002/0153881). In making this rejection the Office Action asserts that the combination of these references teach and/or suggest the claimed invention. The Office Action also asserts that it would be obvious to one of ordinary skill in the art to combine these two references.

The Office Action admits that Stewart fails to disclose the recited element utilizing a magnetoresistance effect. The Office Action cites Taguchi as curing this deficiency in Stewart. While Taguchi may teach an element utilizing a magnetoresistance effect, there is no motivation to combine Stewart and Taguchi since Stewart fails to teach any

nonvolatile data holding elements. Specifically, there is no motivation in these references to replace a volatile data holding element with a non-volatile data holding element.

Therefore a person of ordinary skill in the art would have no motivation to combine these references. Consequently, Applicants request reconsideration and withdrawal of this rejection of claim 7.

Allowable Subject Matter

Claims 5, 6, and 11 were acknowledged as containing allowable subject matter, but were objected to as depending from a rejected base claim (claim 2). As discussed above claim 2 from which these claims depend is allowable. Accordingly, Applicants request reconsideration and withdrawal of this objection.

Conclusion


Applicants remarks have overcome the rejections set forth in the Office Action dated May 18, 2004. Specifically, Applicants remarks have distinguished claims 2, 3, 8, and 9 from Stewart and thus overcome the rejection of these claims under 35 U.S.C. 102(e). Applicants remarks have distinguished claims 2, 3, and 9 from Dawson and thus overcome the rejection of these claims under 35 U.S.C. 102(e). Applicants remarks have distinguished claim 4 from the combination of Stewart and Adachi and thus overcome the rejection of this claim under 35 U.S.C. 103(a). Applicants remarks have distinguished claim 7 from the combination of Stewart and Taguchi and thus overcome the rejection of this claim under 35 U.S.C. 103(a). Claims 5, 6, and 11 were acknowledged as containing allowable subject matter. Accordingly, claims 2-9 and 11

are in condition for allowance. Therefore, Applicants request reconsideration and allowance of claims 2-9 and 11.

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event that this paper is not considered to be timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300, referring to client-matter number 107400-00021.

Respectfully submitted,



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